

***Bassus macadamiae* sp. n. (Hymenoptera: Braconidae: Agathidinae),
Parasitoid of *Ecdytolopha torticornis* and *E. aurantianum*
(Lepidoptera: Tortricidae) in Macadamia Nut Crops in Central and
South America**

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Abstract.—*Bassus macadamiae* Briceño and Sharkey, sp. n. is described and illustrated. Specimens of *B. macadamiae* are solitary internal parasitoids of larvae of the tortricid moth *Ecdytolopha torticornis* (Meyrick) and *E. aurantianum* (Lima), insect pests of macadamia crops, *Macadamia integrifolia* Maiden & Botche, in Central and South America.

Ecdytolopha torticornis (Meyrick) and *E. aurantianum* (Lima) (Lepidoptera: Tortricidae) are pests of the macadamia nut, *Macadamia integrifolia* Maiden & Botche (Fam. Proteaceae), in Central and South America (Arizaleta and Diaz 1995, Badilla 1996). Lara (1987) reviewed the economic importance of *Ecdytolopha torticornis* in Costa Rica, and reported damage of 16%. Blanco *et al.* (1993) reported infestation rates in Costa Rica of 12–39% for hulls, and 1–7% for nuts. In Venezuela, Arizaleta *et al.*, (1997) reported *E. aurantianum* as the main pest attacking macadamia crops, but no studies have been conducted to ascertain damage levels.

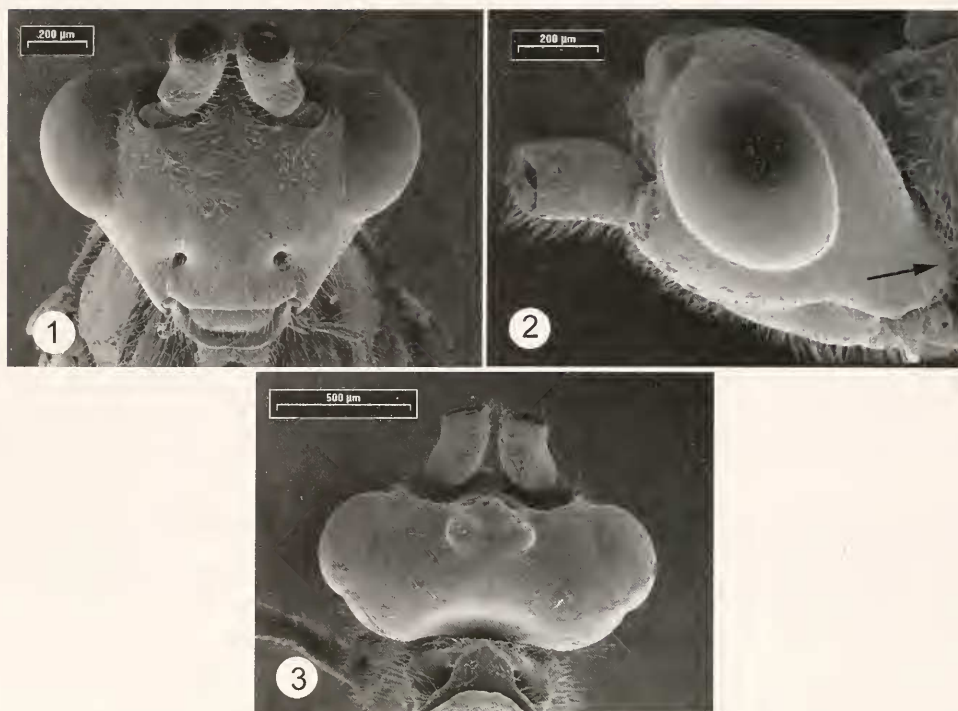
Larvae of *Ecdytolopha torticornis* and *E. aurantianum* feed mainly in the mesocarp and endocarp of the nuts. Blanco *et al.* (1993) reported three braconid wasps parasitizing larvae of *E. torticornis* in Costa Rica, i.e., two *Apanteles* spp. and one *Ascogaster* sp. Specimens of an undescribed species of *Bassus* have been reared from larvae of *E. torticornis* and *E. aurantianum*, attacking young nuts of macadamia in Costa Rica and Venezuela (Arizaleta and

Díaz 1995, as *Agathis* sp.) and due to its economic importance we feel that a formal name for the parasitoid is useful.

MATERIALS AND METHODS

The terminology for wing venation follows Sharkey and Wharton (1997). Other terminology follows Chou and Sharkey (1989). Abbreviations for insect collections are as follows:

- UCOB: Museo Entomológico "José Manuel Osorio" at the Universidad Centroccidental "Lisandro Alvarado" in Barquisimeto, Venezuela.
- UCR: Insect Collection of the Universidad de Costa Rica, San José, Costa Rica.
- MIZA: Museo del Instituto de Zoología Agrícola "Francisco Fernández Yépez", Universidad Central de Venezuela, Maracay, Venezuela.
- UK: Insect Collection of the Department of Entomology, University of Kentucky, Lexington, Kentucky, USA.



Figs. 1-3. *Bassus macadamiae*: 1, head frontal view; 2, head lateral view; 3, head dorsal view.

***Bassus macadamiae* Briceño & Sharkey
sp. n.**

(Figs. 1-10)

Holotype female.—(numbers in parenthesis refer to ranges found in the 14 specimens comprising the type series). *Length*: Body 5.6 mm (4.4-6.8), antenna 4.7 mm (3.9-5.7), forewing 5.1 mm (4.1-5.8), ovipositor sheath 5.0 mm (4.0-5.5). *Head* (Figs. 1-3): Vertex sparsely minutely punctate; distance between lateral ocelli 0.5 (0.46-0.60) times ocello-ocular distance

and 1.2 (1.0-1.5) times diameter of median ocellus; frons sparsely minutely punctate; frontal depression moderately deep; antenna with 35 (34-36) flagellomeres; scape 1.3 (1.1-1.5) times as long as wide; face 1.5 (1.4-1.6) times as wide as eye height and 0.6 (0.56-0.6) times as wide as head; face and clypeus sparsely minutely punctate; face 0.85 (0.7-0.9) times as high as wide; tentorio-ocular line 0.93 (0.63-0.93) times inter-tentorial line; malar space 2.7 (2.2-3.0) times basal width of mandible and 0.62 (0.48-0.68) times eye height; temple, in dorsal view, evenly curved; ridge between antenna absent; gena rounded posteroventrally. *Mesosoma* (Figs. 4-8): Pronotum sparsely minutely punctate; notaulus complete and smooth; scutellar furrow smooth, without carinae; scutellum weakly punctate, without apical carina; posterior semicircular depression of scutellum present; posterior surface of scutellum punctate; propleuron without distinct bump; mesopleuron mostly smooth,

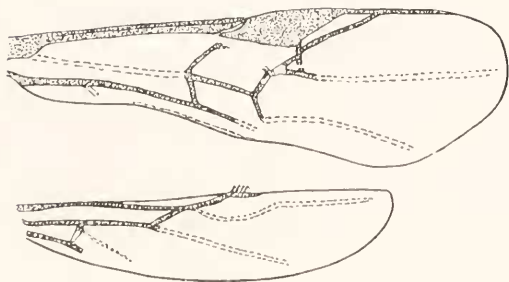
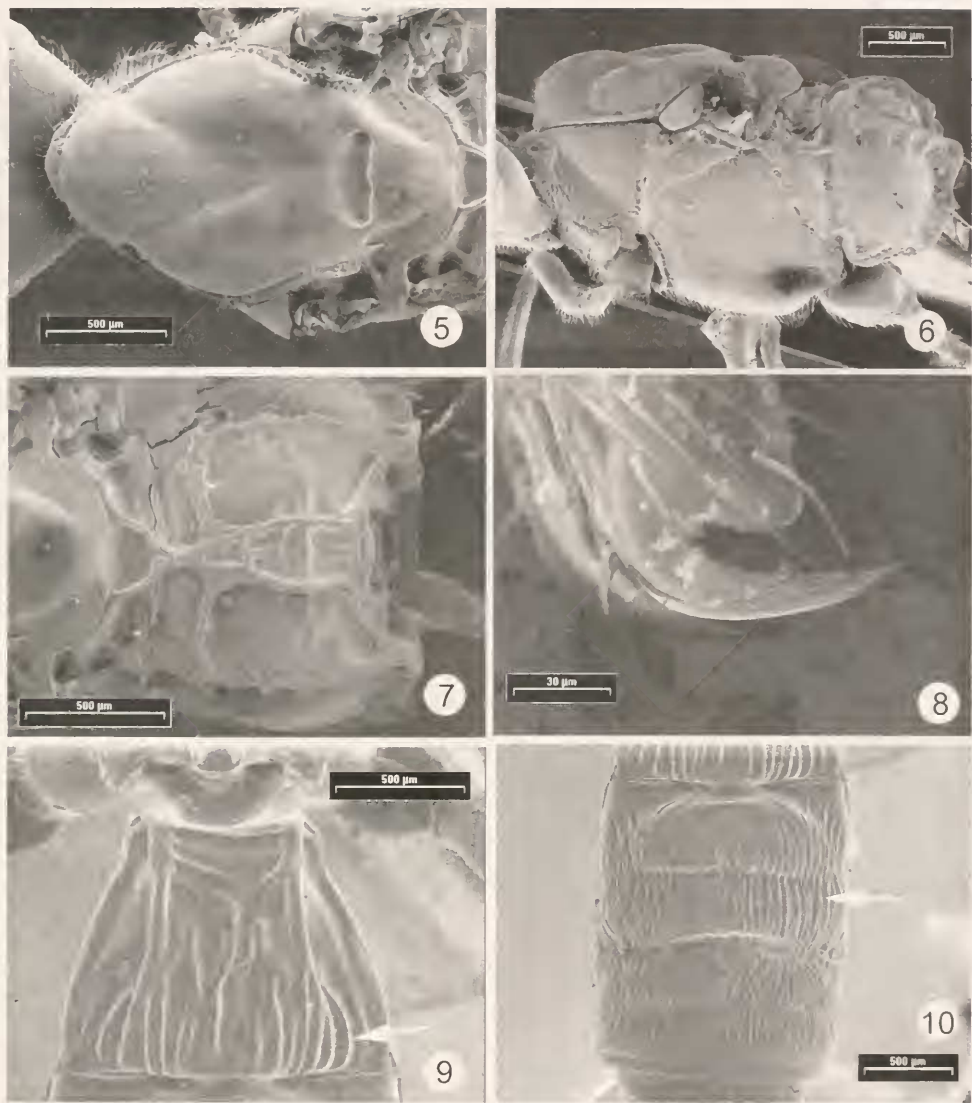


Fig. 4. *Bassus macadamiae*: wings.



Figs. 5–10. *Bassus macadamiae*: 5, dorsal view of mesosoma; 6, lateral view of mesosoma; 7, propodeum; 8, tarsal claw; 9, dorsal view of first metasomal tergum; 10, dorsal view of second and third metasomal terga.

weakly punctate on margins, with posterior margin carinate; sternaulus distinct, with deep posterior depression; metapleuron sparsely minutely punctate, rugulose ventrally; propodeum carinate with two distinct median longitudinal carinae and two distinct lateral longitudinal carinae; anterior median areola and posterior median areola present; anterior transverse carina present; propodeal pseudosternite with strong transverse ridge; hind coxal

cavity separated from metasomal foramen by wide and well developed sclerite; forewing 3.1 (3.0–3.6) times as long as wide; vein 1cu-a of forewing postfurcal; 2nd submarginal cell of forewing (1RS) triangular and petiolate, i.e., 2RS and r-m veins fused anteriorly; RS of forewing almost straight; midtibia with 7 (7–9) spines; medial midtibial spur 0.44 (0.36–0.55) times length of basitarsomere; hind femur 3.1 (2.6–3.2) times longer than wide; medial

hind tibial spur 0.43 (0.36–0.47) times as long as basitarsomere; tarsal claws simple with a right-angled basal lobe. *Metasoma* (Figs. 9–10): First median tergite costate, 0.91 (0.81–0.92) times as long as wide apically; second median tergite costate 0.4 (0.27–0.4) times as long as wide, with semicircular transverse groove; third median tergite costate, 0.29 (0.23–0.3) times as long as wide, with semicircular transverse groove; ovipositor sheath 1.05 (0.8–1.2) times as long as forewing. *Color*: Mostly reddish orange. Head, including antenna, dark brown; clypeus and mouthparts light brown; maxillary and labial palpi yellow; pronotum and mesonotum dark brown; metanotum, propodeum and metasoma red to orange; fore and hind tarsus yellow, remainder dark brown; hind coxa red to orange, remainder dark brown; wings hyaline with weak infuscation; stigma and veins dark brown; ovipositor sheath melanitic.

Male.—Essentially as in female.

Diagnosis.—Members of the new species may be distinguished from all other New World species of *Bassus* by the following combination of characters: first three metasomal medial tergites costate; propodeal pseudosternite with a strong transverse carina; hind tibia with 14–18 spines; ovipositor sheath about as long as the forewing.

Material examined.—*Holotype female*: VENEZUELA, Villanueva, Lara; 1200m; VII-1993 (F. Díaz) (UCOB). *Paratypes*: COSTA RICA: 1 Female, 1 male, Limón, Siquirres, 03-VI-1995 (UCR). 3 females, Turrialba, Cartago, 650 m, 29-VI-1996 (UCR). VENEZUELA, Lara: 3 females, Villanueva, 1200m, VII-1993 (F. Díaz) (UCOB) (MIZA). 1 male, Villanueva, 1200 m, III-1993, (F. Díaz) (UCOB). 1 Female, 2 males, Villanueva, 1200 m, 02-II-1995, (F. Díaz) (UCOB) (UK). 1 Female, Villanueva, 1200 m, 11-XI-97 (R. Paz) (UCOB).

Host.—Larvae of *Ecdytolopha torticornis* and *E. aurantium*. Females of *B. macadamiae* attack first instar larvae of both

hosts before they penetrate the nut. The parasitoid larva develops until the host leaves the nut to prepare to pupate. The parasitoid then emerges from the host and weaves a white cocoon on the external surface of the nut inside the hull.

Etymology.—The specific name *macadamiae* refers to the name of the host plant *Macadamia integrifolia*.

Remarks.—The genus *Bassus* lacks any apparent autapomorphy. At least, we know of none and none has been offered in the literature. The Microdini, to which *Bassus* belongs (Sharkey 1992), is an assemblage of mostly monophyletic genera. However, *Bassus* itself is probably rendered paraphyletic by the recognition of most or all of these genera. It will take a more quantitative approach to test this thesis.

Bassus macadamiae belongs to a species group of *Bassus* that illustrates this paraphyly problem. Members of this species group share a few putative synapomorphies such as longitudinal costae on metasomal terga one, two, and three, and a strong transverse ridge of the propodeal pseudosternite (area between the hind legs). These same characters are found in members of the genus *Braunsia* Kriechbaumer. On this limited evidence, and lacking contrary hypotheses supported with character state evidence, it seems that *Braunsia* s.l. and this species group of *Bassus* are more closely related to each other than members of the species group are to other species presently placed within the concept of *Bassus*. The distribution of the species group is cosmopolitan with the relative species abundance being greater in northern temperate regions. The similarities between species of *Braunsia* and members of this species group have never been noted in the literature but they are obvious enough to have induced Enderlein to describe some members of this species group of *Bassus* in *Braunsia*; *Bassus ochracea* (Enderlein) is one example. The species group includes, *Bassus ater* (Chou and

Sharkey), *B. ebulus* (Nixon), *B. atripes* (Cresson) and *B. calcaratus* (Cresson).

As it is presently defined, *Braunsia* is restricted to the Old World and appears to be monophyletic. Including the species described here in *Braunsia* would drastically expand the concept of the genus and, in our view, this generic reappraisal should only be done in the context of a more complete cladistic analysis. Here we take a conservative approach in applying the name *Bassus* to the new species.

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